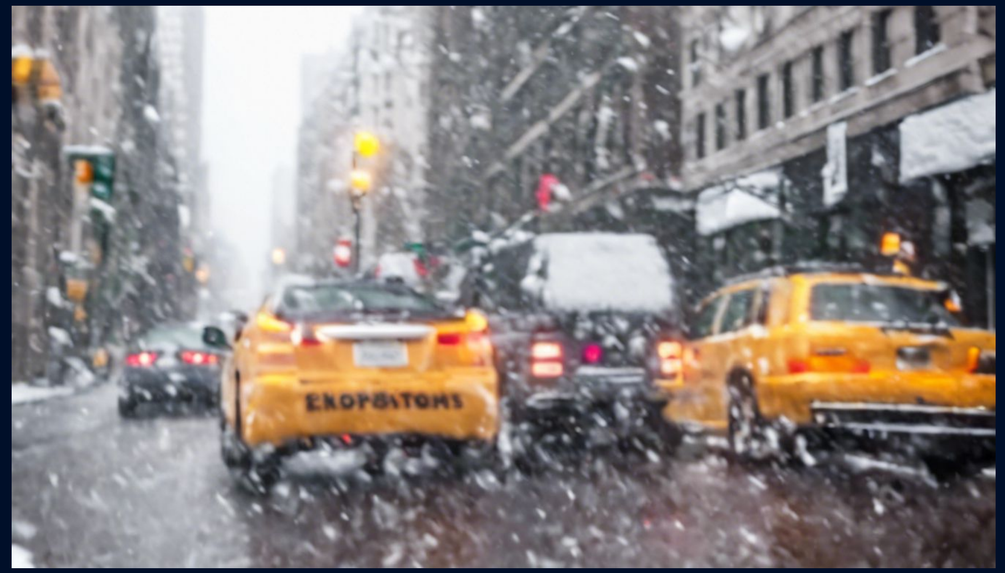


Foresight

Expect the unexpected

The Problem

01 Out of Distribution Scenes

Bad weather obscures camera data, leads to accidents

02 Normal Data Augmentation

Done via cropping, rotating, or flipping the original image

03 Synthetic Data Generation

Simulated Data (VG2Real), traditional generated data (CycleGAN)

04 Novel Data Augmentation

New method of data augmentation that involves using stable diffusion

Meet Our Team

Allen Naliath

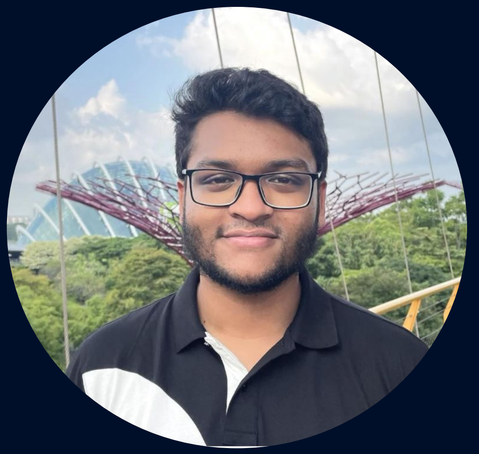
Stanford University

Shivam Kak

Princeton University

Pujith Kachana

Carnegie Mellon University



Sazzad Islam

Stanford University

Our Process

01

Upload Dataset

Team uploads their dataset and specifies a condition to apply

02

Prompt Generation

We use LangChain to ask GPT-4 to generate many variations of Stability prompts

03

Image Generation

These prompts are used to generate various obscure images of adverse weather conditions

04

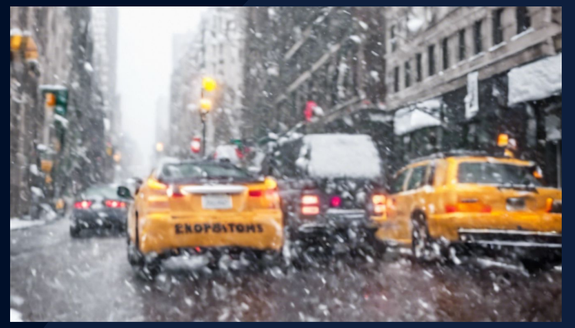
Object Detection

We run object detection on the clean images and map the metadata to the obscure images, resulting in a diverse and rich dataset

Image Generation

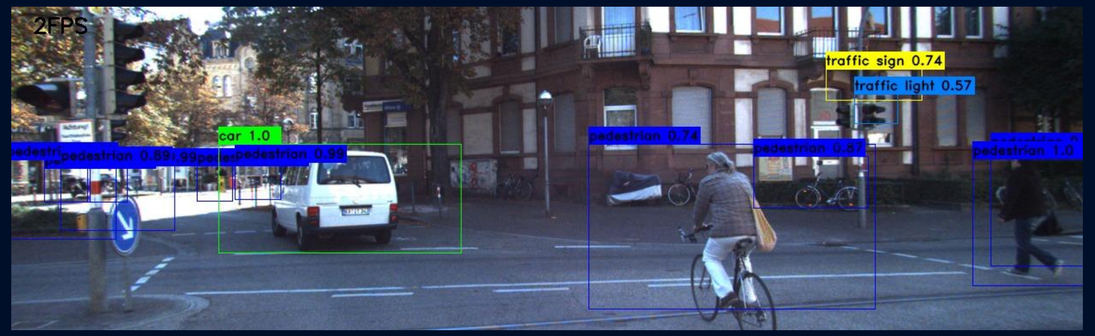
rain

snow



Object Detection (Snow)

Original



85% Performance Drop

Weather + No Mapping

100% object retention 👍

Weather + Mapping

Key Learnings

01 Diffusion vs GANs

GANs are powerful, but way too specific

02 New Weather vs Original Objects

Finding the right balance for image strength is difficult

03 Image Processing

New method of adding pixel noise that can diffuse into weather

Thank You!

Now for the Demo!